

Multispectral Thermal Infrared Data from ASTER

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ASTER, now in orbit on NASA's Terra Spacecraft, has been provided by the Japanese Ministry of Economics, Trade and Industry (METI). It creates high-spatial-resolution (15-90 m) multispectral images of the Earth's surface in order to help monitor and understand the physical processes that are occurring which affect climate and land surface change.

ASTER has three visible and near-infrared (VNIR) channels between 0.5 and 0.9 micrometers with 15 m resolution, six shortwave infrared (SWIR) channels between 1.6 and 2.43 micrometers, and five thermal infrared (TIR) channels between 8 and 12 micrometers, with 90 m resolution. Thus, it provides the first high-spatial-resolution multispectral thermal infrared data set from orbit. An additional, backward pointing, VNIR telescope provides along-track stereo coverage at 15 m resolution.

While MODIS and MISR monitor many of the same variables globally on a daily basis, ASTER provides data at a scale that can be directly related to detailed physical processes. These data help bridge the gap between field observations and the data acquired by MODIS and MISR, and between process models and climate and forecast models. ASTER data can be used to help establish a baseline for long-term monitoring of local and regional changes on the Earth's surface, which either lead to, or are in response to, global climate change, e.g., land use, deforestation, desertification, lake and playa water level changes, changes in vegetation communities, glacial movements. The thermal data is being used specifically for monitoring of volcanic areas, surface heat balance studies, and geologic mapping.

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